

## High-Performance Catalysts for Small Impulse Bit Thrusters, Phase II

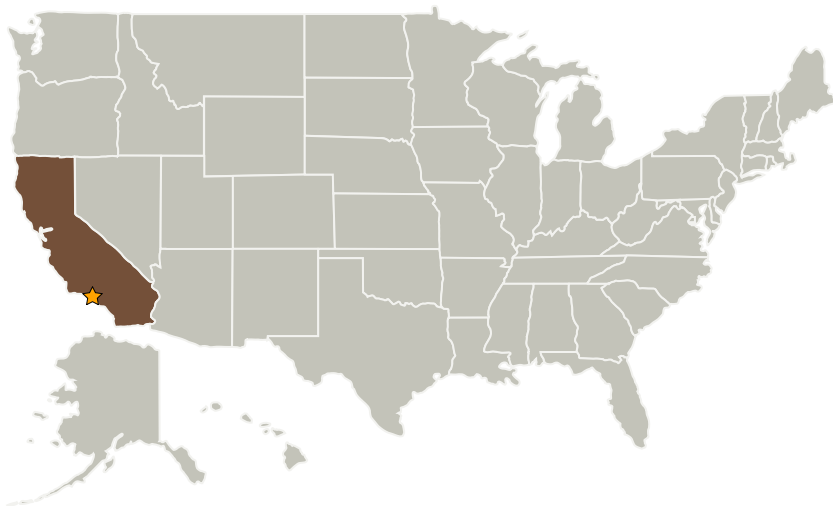
Completed Technology Project (2004 - 2006)



## Project Introduction

The current push to develop small satellites, the need for formation flying constellations, and the desire to replace reaction control wheels have resulted in the need for thrusters that can deliver very small impulse bits. The required thrusters are much smaller than those available today, so new technologies will have to be developed. In Phase I, Ultramet focused on the development of catalysts that could be scaled down to the dimensions required for such small thrusters. To facilitate testing of these catalysts, Tridyne was used as the propellant, and several dozen catalyst beds were tested in a 5-lbf test engine. Several of the catalyst beds tested showed faster temperature rises and higher steady-state temperatures than a similar sized bed of Shell-405. For all of the Ultramet catalysts, the supports were monolithic materials that could easily be scaled down for use in microthrusters. Phase II will build on this technology, and enable the resulting catalysts to be used with other propellants, such as hydrazine or HAN-based monopropellants.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory (JPL)	Lead Organization	NASA Center	Pasadena, California
Ultramet	Supporting Organization	Industry	Pacoima, California



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Jet Propulsion Laboratory (JPL)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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### Primary U.S. Work Locations

California

### Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

### Technology Areas

**Primary:**

- TX01 Propulsion Systems
  - └ TX01.1 Chemical Space Propulsion
    - └ TX01.1.8 Warm Gas